TABLE 1-continued

Error Description	Condition	Recovery
Product Level Low	During Run state Product and divert valves duty cycle <= 2% for more than 5 min.	Retry After Clear
System too Cold	During Run state Low Pressure temp < 104° C.	Retry After Clear
Too long in State	In fill state > 12 min or In heat state > 4 hours or In hx prime state > 2.5 hours or In start pump state > 8 min	No
Lack of water in sump	Sump temp > 115° C. and Sump temp − LP temp > 25° C.	Retry After Clear
Error Reading from Flash	CRC or data length error reading flash memory	No
Error Writing to Flash	Error writing constant values to flash memory	No
Motor Error	Commanded motor speed > 50 and actual to commanded motor speed difference is > MotorErrorSpeed rpm for > MotorErrorTime seconds	Retry After Clear
Magnetic coupling slipping	HPTemp − LPTemp < 1.5° C. and Prod and Divert duty < 10%	Retry After Clear
Heater Fault	Not Implemented	Retry After Clear
Over Current	System current > 13A	Retry After fault
Conductivity Sensor Open	Not Implemented	No
Conductivity Sensor Short	AD reading < 150 counts	No
Conductivity Too High	In Run state Conductivity > CondoLimitQ10 for > CondoErrTime Seconds	No
MCE Communications Fault	No response from MCE after 5 retries at 10 sec per retry	No
MCE Fault	No MCE awake signal after reasserting MCE Enable for 20 consecutive tries	No

MCE

[0776] The MCE message task handles the communications between the ARM control processor and the MCE processor. In some embodiments, there are 2 discrete digital signals between the ARM and the MCE processors: the MCEEnable line and the MCEAwake line. The MCEEnable line is an output from the ARM processor and an input to the MCE processor. This line is set to "0" to enable the MCE. While MCEEnable is a "1" the MCE processor is held in the reset state. The MCEAwake line is an output from the MCE processor and an input to the ARM processor. In some embodiments, the MCE_msg task will only process messages if the MCEAWAKE line is active. If the MCEAwake line is not active the MCEEnable line is reset to the enable state. If after a predetermined amount of time, e.g., 60 seconds, of asserting the MCEEnable line the MCEAwake line does not become active an MCE Fault may be issued.

[0777] The MceMsg process function creates the processing signals as events occur. It will then distribute them to a heater command state machine. If the heater command state machine does not handle the signal it is then passed to the motor command state machine. If the MCE state machine does not handle the event, e.g., if the event is a response that was not expected, an error message is sent to the MCE. However, if the MCE state machine does handle the event, a status request is sent to the MCE. If a response to the command is not received within a predetermined time, e.g. 10 seconds, the command is reissued. If no response is received after a predetermined number of attempts, e.g. 5 retries, the MCE Communications Fault is signaled. MCE status is returned in the command response packets.

[0778] Therefore, the control system described above may be used to determine the integrity of the apparatus/system and also, with information relating to the rate of water product production, the control system may signal when the system should undergo maintenance, including, but not limited to, cleaning/de-scaling. In some embodiments, the system may signal that the maintenance is needed, e.g., post a message to the external app and/or indicate same on a User Interface on the machine, including but not limited to, one or more of: LEDs, text message, symbol/icon, etc. In some embodiments, the system may automatically undergo a maintenance procedure, e.g., cleaning/de-scaling, however, in other embodiments, the maintenance procedure may be performed manually and then confirmed through, e.g., a user interface, that the maintenance was completed.

[0779] Communication with an external app also presents many methods for controlling the apparatus remotely. For example, with regular logs and software communication, a user may determine which apparatus needs maintenance and may schedule same remotely. This may be desirable/beneficial for many reasons, including, but not limited to, running one or more water vapor distillation apparatus/machines remotely in various countries/regions including, but not limited to, areas that are very remote or scarcely populated.

[0780] In some embodiments, a manual cleaning/de-scaling may be performed by using pressurized clean water and flushing to system. In some embodiments, the apparatus may be connected to an acid cleaning solution for flushing/cleaning. In some embodiments, a pump is used to pump the water and/or cleaning solution through the apparatus/machine.